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FINAL PROPOSED ACTION MEMORANDUM FOR THE REMEDIATION OF INDIVIDUAL HAZARDOUS SUBSTANCE SITE 109, RYANS'S PIT

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TABLE OF CONTENTS

ACRONYMS

Am ..... Americium
ARARs ..... Applicable or Relevant and Appropriate Requirements
BH ..... Borehole
BGS ..... Below ground surface
BSL ..... Background screening level
CCR ..... Colorado Code of Regulations
CHWA ..... Colorado Hazardous Waste Act
COC ..... Contaminant of Concern
DCA ..... Dichloroethane
DCE ..... Dichloroethylene
EPA ..... Environmental Protection Agency
IHSS ..... Individual Hazardous Substance Site
IAG ..... Rocky Flats Interagency Agreement
OU ..... Operable Unit
PCE ..... Tetrachloroethylene (synonym perchloroethylene)
Pu ..... Plutonium
RFETS ..... Rocky Flats Environmental Technology Site
SQL ..... Sample quantitation limit
SVOCs ..... Semi-volatile organic compounds
TCE ..... Trichloroethylene
TD ..... Thermal desorption
USDOE ..... United States Department of Energy
VOCs ..... Volatile organic compounds

FINAL PROPOSED ACTION MEMORANDUM FOR THE REMEDIATION OF INDIVIDUAL HAZARDOUS SUBSTANCE SITE 109, RYAN'S PIT

1.0 PURPOSE

This source removal action is proposed to remediate the contaminated soils in Individual Hazardous Substance Site (IHSS) 109 of Operable Unit 2, Rocky Flats Environmental Technology Site (RFETS), which is contributing to the degradation of groundwater in the area. Organic chemicals were disposed in the trench for a period of approximately five years before the trench was backfilled and its use was discontinued. Under this proposed action, the contaminated soils will be removed from the trench and will be remediated using thermal desorption. The trench site will be reestablished to achieve comparable conditions in the surrounding area.

2.0 PROJECT DESCRIPTION

2.1 Background

IHSS 109, Operable Unit (OU) 2 was used from approximately 1966 through 1970 to dispose of nonradioactive liquid chemicals. The organic chemicals, disposed in small quantities, included trichloroethane, tetrachloroethylene, trichloroethylene, and diesel fuel. Other chemicals may have included paint thinner and small quantities of construction-related materials.

Organic compounds from miscellaneous small projects, e.g. bench scale testing and special projects, were believed to be collected for disposal at IHSS 109 . Standard process waste solvents from production buildings are not believed to have been disposed in IHSS 109 .

The trench is approximately 25 feet by 12 feet by 5 feet deep. These dimensions are based on field investigations and sample collection in the spring 1995, historical aerial photography, and historical accounts by a health physicist familiar with the trench and its whereabouts (see Figure 2.1-1). These dimensions, however, conflict with the reported dimensions identified in the "Phase II RFI/RI Report, Operable Unit No. 2," April, 1995 which references two historical documents. In 1970, when the boundaries for IHSS 109 were being created, the boundary was based on the general area of where the trench existed but was not intended to map the boundaries of that particular trench. This discrepancy in the IHSS 109 boundaries will be addressed and corrected in the next quarterly report update for the Historical Release Report.

The trench lies within an area where surficial soils are contaminated with Americium-241 (Am-241) and Plutonium-239 (Pu-239). These contaminants were deposited by wind transport from the 903 Pad drum storage area.

2.2 Data Summary

Three sets of data are presented in this section which support the indication that the IHSS 109 trench is a contributing source of volatile organic contaminants to the downgradient subsurface soils and groundwater. The first set of data was collected in 1992 as part of the remedial investigation. Four boreholes were sampled downgradient of the trench. The second set of data represents the samples collected in the spring of 1995. These samples were taken directly within the trench boundaries, and show increased concentrations of volatile organic compounds as compared to the downgradient boreholes. The final set of data is a compilation of monitoring data taken from the monitor wells

located downgradient from IHSS 109. As the monitoring well data indicates, the groundwater downgradient of the trench contains elevated concentrations of volatile organics similar to those present in the trench.

1992 Sampling

Soil samples were collected from a series of boreholes (09291, BH2587, 21893, 09491) located downgradient of IHSS 109 in 1992 (see Figure 2.2-1). The data are presented in the Remedial Investigation Report, May 1995, and are summarized as follows.

Volatile organic compounds (VOCs) detected in subsurface soil samples collected downgradient of IHSS 109 included tetrachloroethylene (PCE) (maximum concentration of 10,000 µg/kg in a sample collected from borehole BH2587 at a depth of 14.5 to 15.7 feet below ground surface (BGS)); trichloroethylene (TCE) (maximum concentration of 16,000 µg/kg in a sample collected from borehole BH2587 at a depth of 18.5 to 19.3 feet BGS); toluene (maximum concentration of 2,000 µg/kg in a sample collected from borehole 21891 at a depth of 43.8 to 44.1 feet BGS); and total xylenes (maximum concentration of 3,300 µg/kg in a sample collected from borehole BH2587 at a depth of 14.5 to 15.7 feet BGS). Several additional VOC compounds were also detected but at concentrations less than 800 µg/kg. Detected VOC compounds are summarized in Table 2.3-1. The depth to the seasonal high groundwater level ranges from three to ten feet BGS. Therefore, most of the VOC maximum concentrations detected were found in samples collected below the water table.

All of the semi-volatile organic compounds (SVOCs) detected were at concentrations below their respective sample quantitation limits (SQLs). Therefore, the SVOCs are not considered to be chemicals of concern.

Six metals (arsenic, barium, cadmium, cobalt, lead, and zinc) were detected above the background screening levels (BSLs) in subsurface samples collected (by Target Analyte List "total" metals analysis). However, detections were typically at or only slightly above the respective BSLs (with the exception of cobalt and barium). One sample analyzed had a cobalt concentration of 204 mg/kg that exceed the BSL of 29.2 mg/kg. Barium concentrations exceeded the BSL of 289 mg/kg in 2 samples; the maximum concentration was 1899 mg/kg.

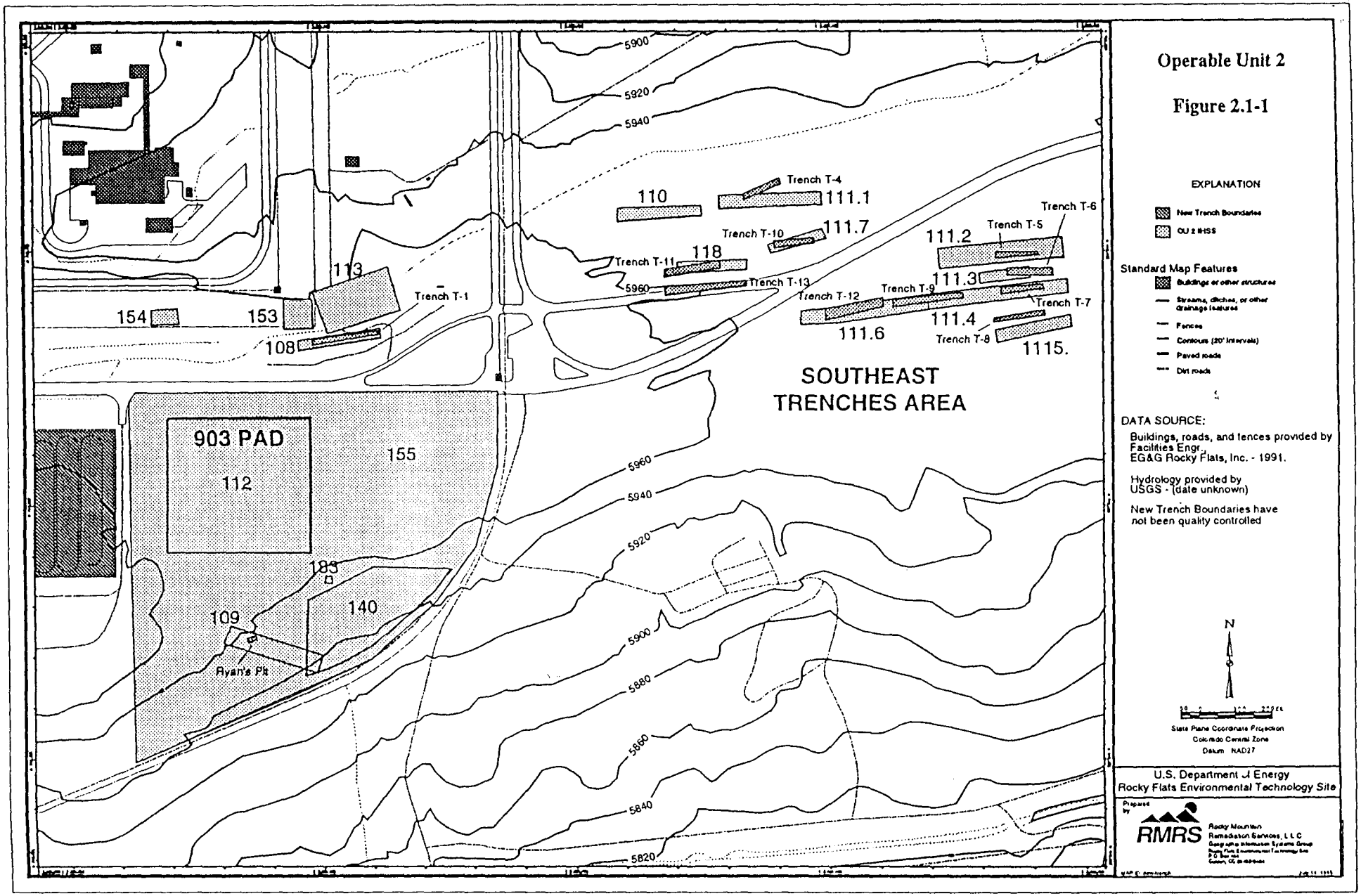
Several radionuclides were detected above the BSLs. However, only Pu-239/240 (a subsurface soil contaminant of concern (COC)) exceeded the BSLs (0.066 pCi/g). The maximum detected activity of Pu-239/240 was 3.2 pCi/g, associated with a sample collected at a depth of zero to nine feet. One sample analyzed had a detected Am-241 activity (0.22 pCi/g) that exceeded the BSL (0.022 pCi/g) by one order of magnitude.

1995 Sampling

During the spring of 1995, soil samples were collected at various depths from soil borings in the trench. The maximum concentrations of VOCs from preliminary analytical data are identified in Table 2.3-2. The analytical data for the metal and radionuclide samples collected from the trench are still unavailable.

Monitoring Well Sampling

The downgradient monitoring wells, 07391 and 0271, show similar contamination in the groundwater as to what is present in IHSS 109 . Table 2.3-3 shows a summary of the detectable organic contamination data in the groundwater.


Operable Unit 2
Figure 2.1-1
EXPLANATION
New Trench Boundaries
OU 2 IHSS
Standard Map Features
Buildings or other structures
Streams, ditches, or other drainage features
Fences
Contours (20' intervals)
Paved roads
Dirt roads
DATA SOURCE:
Buildings, roads, and fences provided by Facilities Engr., EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by USGS - (date unknown)
New Trench Boundaries have not been quality controlled
N
State Plane Coordinate Projection
Colorado Central Zone
Datum NAD27
U.S. Department of Energy
Rocky Flats Environmental Technology Site
Prepared by
RMRS
Rocky Mountain Remediation Services, L.L.C.
SOUTHEAST TRENCHES AREA
903 PAD
112
155
140
109
183
Ryan's Pit
Trench T-1
Trench T-4
Trench T-5
Trench T-6
Trench T-7
Trench T-8
Trench T-9
Trench T-10
Trench T-11
Trench T-12
Trench T-13
110
111.1
111.2
111.3
111.4
111.6
111.7
1115.
118
113
154
153
108
5960
5900
5920
5940
5880
5860
5840
5820

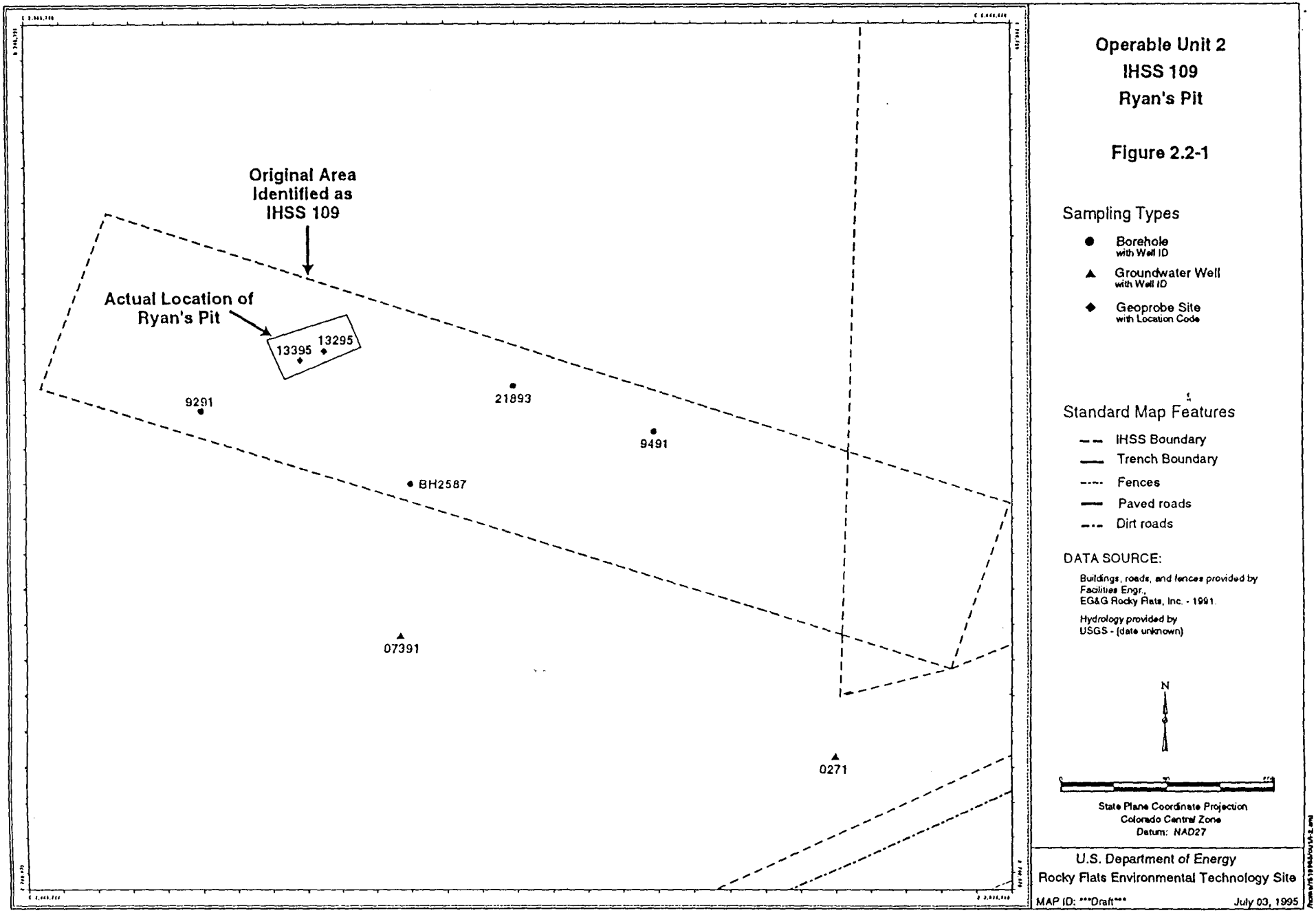

Original Area
Identified as
IHSS 109
Actual Location of
Ryan's Pit
13395
13295
9291
21893
9491
BH2587
07391
0271
Operable Unit 2
IHSS 109
Ryan's Pit
Figure 2.2-1
Sampling Types
Borehole
with Well ID
Groundwater Well
with Well ID
Geoprobe Site
with Location Code
Standard Map Features
IHSS Boundary
Trench Boundary
Fences
Paved roads
Dirt roads
DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (date unknown)
N
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27
U.S. Department of Energy
Rocky Flats Environmental Technology Site
MAP ID: ***Draft***
July 03, 1995

TABLE 2.3-1
903 PAD SOURCE AREA
ANALYTES DETECTED IN SUBSURFACE SOILS AT IHSS 109

Analyte	Background Mean Plus Two Standard Deviations	Number of Samples	Number of Detections	Percent Detections	Concentration or Activity Range	Mean Concentration or Activity(2)
Volatile Organic Compounds (µg/kg) [3]						
1,1,1-Trichloroethane	NA	20	1	5.0%	75J	75
2-Butanone	NA	14	3	21.4%	6J-210J	77
4-Methyl-2-pentanone	NA	16	1	6.3%	120J	120
Acetone	NA	20	7	35.0%	8BJ-1100B-RV	339
Chloroethane	NA	20	2	10.0%	7J-50J	28.5
Chloroform	NA	20	1	5. 0%	130J	130
Ethylbenzene	NA	20	3	15.0%	11J-780	360
Methylene chloride	NA	20	5	25.0%	3JB-150JB-RV	40
Tetrachloroethene	NA	20	5	25.0%	8J-10000	2793
Toluene	NA	20	17	85.0%	6J-2000	263
Total xylenes	NA	20	3	15.0%	60-3300	1280
Trichloroethene	NA	20	13	65.0%	3J-16000	2242
Semivolatile Organic Compounds (µg/kg/)[3]						
Benzo(a)pyrene	NA	18	2	11.1%	200J-350J	275
Bis(2-ethylhexyl)phthalate	NA	18	1	5.6%	200J	200
Di-n-butyl phthalate	NA	18	1	5.6%	63J	63
Di-n-octyl phthalate	NA	18	3	16.7%	56J-260J	130
PCOC Metals above BSL (mg/kg)[4][5]						
Arsenic	13.2	24	2	8.3%	14-15.7	14.85
Barium	289	24	2	8.3%	466-1899	1183
Cadmium	1.7	24	6	25.0%	1.9-5.2	3.9
Cobalt	29.2	24	1	4.2%	204	204
Lead24.9	24	1	4.2%	24.9		24.9
Zinc	139.1	24	1	4.2%	158	158

TABLE 2.3-1
903 PAD SOURCE AREA
ANALYTES DETECTED IN SUBSURFACE SOILS AT IHSS 109
(continued)

Analyte	Background Mean Plus Two Standard Deviations	Number of Samples	Number of Detections	Percent Detections	Concentration or Activity Range	Mean Concentration or Activity(2)
PCOC Radionuclides above BSL (pCi/g)(4)(5)(6)						
Americium-241	0.012	21	2	9.5%	0.0137-0.22	0.117
Cesium-137	0.094	9	2	22.2%	0.1-1.4	0.8
Gross alpha	43.483	21	3	14.3%	45-48	46
Gross beta	36.839	22	1	4.5%	37	37
Plutonium-239/240	0.018	21	8	38.1%	0.04-3.2	0.47
Radium-2282.038	2.038	9	1	11.1%	2.2	2.2
Tritium (pCi/l)	395.211	18	1	5.6%	640	640
Uranium-235	0.114	15	2	13.3%	0.1162-0.185	0.151
Uranium-238	1.485	21	3	14.3%	1.5-1.7B	1.6
Other Analytes and Parameters (3)(7)						
Ammonia (µg/g)	NA	12	5	41.7%	0.777-5.82	3.983
Cyanide (mg/kg)	NA	24	2	8.3%	1.25-2.44	1.845
Ignitability (F)	NA	6	6	100.0%	230	230
Oil and grease (mg/kg)	NA	6	1	16.7%	1.7	1.7
Percent moisture	NA	6	6	100.0%	9.36-16.01	12.608
Percent solids	NA	6	6	100.0%	76.2-88.3	83.12
pH	NA	24	24	100.0%	7.81-10.03	NA
Sulfide (µg/g)	NA	18	1	5.6%	200	200
Total organic carbon (µg/g)	NA	12	12	100.0%	312-8030	1975.20

Locations: 09291,09491,21893, BH2587

TABLE 2.3-1
903 PAD SOURCE AREA
ANALYTES DETECTED IN SUBSURFACE SOILS AT IHSS 109
(continued)

NA – Not applicable

BSL – Background screening level, defined as the background mean plus 2 standard deviations

PCOC – Potential chemical of concern

(1) J qualifier for organic detections indicates an estimated result; D qualifier for organic detections indicates a dilution result; B qualifier for organic detections indicates an analyte was detected in a blank sample; and B qualifier for inorganic detections indicates an estimated result. RV means rejected during validation; therefore, the data must be evaluated using professional judgement.

(2) The calculation for the mean concentration includes all J,D, and B qualified data.

(3) Background concentrations do not exist and are not applicable for organic compounds and Other Analytes and Parameters.

(4) For metals and radionuclides, only PCOCs have been reviewed and are presented on this table.

(5) Radionuclide and metal results less than the BSL are considered to be non-detections.

(6) Radionuclide activities less than or equal to zero are considered to be non-detections.

(7) The Other Analytes and parameters are listed under the title of Water Quality Parameters in Appendix C and in RFEDS.

Table 2.3-2
IHSS 109 Data Collected March, 1995*
Maximum Concentrations for Analytes

Location 13295

Analyte	Concentration (ppb)	Depth (ft.) BGS
TCE	20,000	3-5
1,2-Dichloropropane	330 J	3-5
4-Methyl-2-pentanone	5,300	3-5

Location 13395

Analyte	Concentration (ppb)	Depth (ft.) BGS
1,1,1-TCA	430,000	3-5
PCE	470,000	3-5
Toluene	310,000	3-5
Ethylbenzene	92,000	3-5
Xylene	590,000	3-5
1,1-DCE	94	3-5
1,1-DCA	340	3-5
2-Butanone	110 J**	3-5
1,1,2-TCA	10 J	8-10
1,1-DCE	94	8-10
1,1-DCA	340	8-10
1,1,1-TCA	260	8-10
TCE	100	8-10
Toluene	220	8-10
Xylene	40	8-10

*Data are unvalidated.
** J qualifier for organic detections indicates an estimated result.

Table 2.3-3
Groundwater Well Data Downgradient of IHSS 109

Groundwater Monitoring Well 07391

Analyte	Concentration (µg/l)	Sample Date	MCL(µg/l)
Chloroform	1200	12-5-94	100
Chloroform	1100	03-14-95	100
PCE	600	12-5-94	5
PCE	780	03-14-95	5
TCE	65000	12-5-94	5
TCE	67000	03-14-95	5

Groundwater Monitoring Well 0271 (abandoned)

Analyte	Concentration (µg/l)	Sample Date	MCL (µg/l)
1,1,1-TCA	12	02-25-92	200
1,2-DCE	180	02-25-92	100
Chloroform	75	02-25-92	100
PCE	57	02-25-92	5
TCE	4800J	02-25-92	5

3.0 PROJECT APPROACH

3.1 Proposed Action Objectives

The IHSS 109 remediation will remove contaminated material identified in association with the trench. The subsurface soils within the trench have substantially higher concentrations of volatile organic contamination than the surrounding areas. This approach of removing the contaminant source from the trenches located in OU 2 is consistent with the long-term objectives and assumptions being used in preparing the Feasibility Study for OU 2. The Feasibility Study assumes that the necessary contaminated sources will be removed from the historical trenches located in OU 2.

The proposed action entails removing VOC-contaminated material and additional soil as needed. Efforts will be made to over-excavate to achieve the removal of the contaminated source material during this proposed action. If bedrock is encountered before the additional buffer is excavated, the excavation will terminate at bedrock.

3.2 Proposed Action

Concurrent with the public review period, field screening and refinement of the trench boundary will be completed. The remediation of IHSS 109 will entail the excavation of up to approximately 200 cubic yards of material (total volume of the trench). After a radiological field screening, the surface topsoil (approximately the top six inches) of the trench will be laid back away from the planned excavation area of the trench.

Next, a backhoe will be used to excavate the soil from the trench. The equipment will be selected with preference towards excavators that minimize worker exposure to the trench and minimize shoring requirements. The VOC-contaminated soil removed from the trench will be containerized and will be staged for onsite thermal desorption or offsite disposal facility based on volume removed.

Throughout the excavation activities, dust minimization techniques will be used to minimize suspension of particulates, such as water sprays and/or dust suppressants. Earth moving operations will not be conducted during periods of high winds. The RFETS Environmental Restoration Field Operations Procedure for Air Monitoring and Dust Control provides guidance for monitoring of wind speed and work stoppage during high winds.

After excavating, samples will be collected and analyzed for the contaminants of concern to establish the post-action conditions of the IHSS in an effort to meet Programmatic Preliminary Remediation Goals or other appropriate action levels.

If dewatering of the trench is necessary, a field sump will be created in the trench and pumped out with a portable submersible pump into a temporary storage tank. The water will be treated in Building 891, the OU 2 Field Treatability Unit, the planned Sitewide Consolidated Water Treatment Facility, or in Building 374, then sampled and released in accordance with respective discharge criteria. Alternatively, the water may be taken offsite for treatment and disposal if appropriate.

3.3 Worker Health and Safety

Due to the contaminants present in the trench, this project falls under the scope of the Occupational Safety and Health Administration (OSHA) construction standard. Under this standard, a site-specific health and safety plan will be developed which addresses the safety and health hazards of each phase of site operations and specifies the requirements and procedures for employee protection. Additionally, a hazard analysis will be developed which specify hazards to which employees may be exposed during each phase of the project and the appropriate control measures to be used. These documents will be integrated wherever possible.

This project involves potential worker exposure to physical, chemical, and radiological hazards. The physical hazards include those associated with excavation activities, use of heavy equipment, and work on uneven surfaces. As planned, workers will not need to enter the trench, therefore eliminating hazards associated with work in excavations and confined spaces. However, if the field conditions vary from the planned approach, an activity analysis will be prepared for the current circumstances and work will proceed according to the appropriate control measures. Employee exposure to noise and heat stress will be evaluated. Appropriate personal protective equipment will be worn throughout the project.

Airborne concentrations of VOCs are expected to be below respective employee exposure limits. However, due to the number of VOCs, the combined concentration will also be evaluated against the exposure limits for chemical mixtures. Routine VOC monitoring will be conducted for any employees who must work near the contaminated soil (ie. soil sampling personnel). Those employees will begin work in level C respiratory protection. Appropriate skin protection will also be worn. Following employee exposure evaluation, the Site Safety Officer may downgrade personal protective equipment requirements.

Monitoring for radiological contamination will be conducted throughout the project. If specified levels are exceeded, the area will be posted, and work will follow a Radiological Work Permit.

3.4 Waste Management

Soils

If sufficient volumes of contaminated soil are generated, the VOC-contaminated soils will be processed using a mobile thermal desorption unit onsite. Thermal desorption is an ex-situ process in which a contaminated soil or sludge is heated to a temperature sufficient to volatilize the organic compounds of concern. Depending on the specific thermal desorption vendor selected, the thermal desorption unit heats the contaminated soils to a temperature range between 200 to 1000 degrees Fahrenheit. The gaseous products are removed by a purge gas and treated in a downstream offgas treatment system. Again, depending on the manufacturer, the offgases may be captured and cooled in a condenser and polished through an activated carbon filter and/or a high efficiency particulate air filter. Prior to being fed into the thermal desorption unit, oversize material, such as large cobbles and debris, will be removed from the soil feedstock. The processed soils from the thermal desorption unit will be returned to the trench. If soil is disposed of offsite, clean fill will be returned to the excavated area.

Based on the historical information about the use of IHSS 109 , no radiological wastes were suspected of being disposed in the trench. The radiological contaminants identified in soils during the remedial investigation were collected by compositing samples from zero to nine feet in depth and may have resulted from the surficial contamination in the area due to the proximity to IHSS 155, the 903 Lip Area. However, if radiological contaminated soils are encountered in the trench above the risk-based programmatic preliminary remediation goals for subsurface soils, the soils will be appropriately disposed of.

Miscellaneous Wastes

Results of historical record reviews and previous field investigations indicate that no metals, wood, or debris were disposed within IHSS 109 . If any miscellaneous waste are encountered, they will be managed, recycled, treated and/or disposed in accordance with the Federal, State and local laws and regulations and RFETS policies and procedures.

Any ancillary wastes generated as part of this proposed action, such as personal protective equipment, will be characterized based on process knowledge and radiological screening, and will be managed, recycled, treated and/or disposed in accordance with the Federal, State and local laws and regulations and RFETS policies and procedures.

4.0 ENVIRONMENTAL IMPACTS

The National Environmental Policy Act (NEPA) requires that actions at RFETS be evaluated for potential impacts to the environment. Impacts to the natural environment resulting from the early action will be minimal and are not expected to result in any adverse impacts to wetlands, floodplains, threatened or endangered species or their habitats, and historic or cultural resources. There will be minor releases of air pollutants from heavy equipment during excavation and a very minor increase in particulates (dust) associated with the operation of loading and unloading and transferring containers. Any airborne particulates and contaminants resulting from the excavation activities will be controlled with best management practices including water sprays and covering. Once the removal of the contaminant source from the trench is complete and the processed material is replaced in the trench, the trench site will be returned to the natural grade in the area and reseeded with appropriate grasses.

5.0 COMPLIANCE WITH ARARS

In accordance with the Interagency Agreement (IAG), an objective of accelerated actions at RFETS is the identification and compliance, to the extent practicable, with federal and state Applicable or Relevant and Appropriate Requirements (ARARs) that are associated with this proposed action. ARARs relating to the action are identified in this section as summarized in Table 5.0-1.

There are no chemical-specific ARARs for this proposed action, nor are there any location-specific ARARs for this proposed action. The Colorado Air Pollution Prevention and Control Act standards for air emissions (5 CCR 1001-3, 5 CCR 1001-9) have been identified as action-specific ARARs. Based on the characterization data available from the trench and the vicinity, the anticipated air emissions will be calculated to determine what type of control measures will need to be employed to ensure compliance with the Colorado Air Pollution Prevention and Control Act standards. This analysis, when completed,will be provided to the Colorado Department of Public Health and Environment prior to the start of the operations.

Table 5.0-1 ARARs for the Proposed Action of IHSS 109

Action	Require-ment	Prerequisite	Citation	ARAR	Comment
Air Quality	Compliance with air emissions	Prevention of exceeding emissions for particulates and VOCs	5 CCR 1001-3 5 CCR 1001-9	Applicable	None

6.0 IMPLEMENTATION SCHEDULE

The removal of the contaminated soils in the IHSS 109 is scheduled to commence in the last fiscal quarter of 1995 with completion of the removal of contaminated soils in IHSS 109 in the last fiscal quarter of 1995. These dates are projected from the work package; any delays, scope, or budget changes may affect these dates.

7.0 COMMENT RESPONSIVENESS SUMMARY

During the public comment period between July 12, 1995 through August, 1995 for the Proposed Action Memorandum for the Remediation of IHSS 109, Ryan's Pit, the following comments were received and have been addressed as part of this Comment Responsiveness Summary.

Comments were received during the public information meeting, July 19, 1995, from Paula Elofson-Gardine and the responses are as follows:

Comment

1. The commenter is concerned about the extremely high levels of VOCs shown in the PAM tables and that the tables represent data as mean and not ranges showing the highs and lows. This point is then de-emphasized and the concern is raised specifically about xylenes and a concern about the health and safety for workers, including worker exposure and that there is appropriate chemical monitoring and containment of vapors. She is interested to know if additional monitors will be added, both for chemicals and particulates.

Response

Table 2.3-1 shows both mean data in the far right column and the concentration ranges as requested under the column labeled: Concentration or Activity Range. Table 2.3-2 indicates the highest concentration found at each of two borehole locations within the pit (mean data is not used).

Section 3.3 of the PAM specifically addresses worker health and safety. As required by the Occupation Safety and Health Department (OSHA), a task specific health and safety plan is being developed for the task. This plan will be in full compliance with the OSHA 1910.120 standards for hazardous waste operations and emergency response. The plan will be the controlling health/safety document and will define the appropriate monitoring requirements as well as personal protective equipment to insure worker health and safety.

Comment

2. The commenter is wondering why there is not any description or discussion of possibly doing de-watering of gradient or trench prior to the remediation action, beginning to perhaps level the playing field before excavation.

Response

De-watering of the trench will take place during the excavation, as addressed in Section 3.2, as appropriate. Installation of a well, and the additional wastewater that would be produced during the de-watering is beyond the scope of this limited response action.

Comment

3. The commenter is interested in whether or not any special containment of the area during excavation of the highest levels of VOCs will be provided.

Response

Physical barriers and postings will be established to prevent unauthorized access into the exclusion zone, trench area, during the source removal. Various practices will be in place to limit releases

during the source removal. Dust minimization techniques will be used to minimize suspension of particulates, as appropriate. Earth moving will not take place during periods of high winds. Appropriate respiratory protection will be worn by workers as required by the project task specific health and safety plan. These precautions will effectively control the spread of contamination and provide a good environment for worker health and safety.

Comment

4. The commenter raised a concern about off-casting (thought to mean off gasing) from the thermal desorption unit and appropriate tracking (monitoring) and availability of the monitoring results.

Response

During the thermal desorption process, the soils are expected to be heated to temperatures between 150 and 300 degrees Fahrenheit. The volatile compounds are volatilized and removed from the heating units under slight vacuum. These gases pass through a HEPA filter, to remove particulates, and are then piped to a cooling unit and condensed. Any remaining VOC gases will be passed through a granulated activated carbon filter.

Air emissions are currently being evaluated through the preparation of an Air Pollution Emissions Notice (APENS) that will be reviewed by the Colorado Air Quality Control Commission. In addition the RCRA air emissions standards for process vents (6 CCR 1007-3, Subparts AA of Section 264) will be followed as appropriate, unless the vendor supplying and operating the unit can demonstrate to the Colorado Department of Public Health and Environment that alternative corrective action temporary unit standards are appropriate.